

ETA - Optik

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Stackfit Library Version 1.00 Reference Guide

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1 FUNCTION DESCRIPTION

1.1 PreSelect

```
int PreSelect(const int anzahlPunkte, double* x, double* y)
int PreSelect(const int anzahl_R_Punkte, double* x_R, double* y_R,
              const int anzahl_T_Punkte, double* x_T, double* y_T)
```

Description

This Function finds good starting values of free parameters for given measurement of reflexion and/or transmission.

Parameters

<i>anzahlPunkte</i>	The number of points in arrays x and y.
<i>x</i>	Array of wavelengths
<i>y</i>	Array of reflexion or transmission
<i>anzahl_R_Punkte</i>	The number of points in arrays <i>x_R</i> and <i>y_R</i> .
<i>x_R</i>	Array of wavelengths for reflexion
<i>y_R</i>	Array of reflexion
<i>anzahl_T_Punkte</i>	The number of points in arrays <i>x_T</i> and <i>y_T</i> .
<i>x_T</i>	Array of wavelengths for transmission
<i>y_T</i>	Array of transmission

Returns

<i>E_FIT_OK</i>	Successfull end of PreSelect()
<i>E_FIT_PRESELECT_FAIL</i>	No results: PreSelect() has failed
<i>E_FIT_INTERVALL</i>	Wrong fit-intervall: Larger than measurement
<i>E_FIT_STARTTHICKNESSES</i>	Bad startvalues for thicknesses
<i>E_FIT_START_OSZILL_PARAMETERS</i>	Bad startvalues for material parameters
<i>E_FIT_MEMORY</i>	Memory Error

Comments

PreSelect() should be used in case of quite poor or uncertain start parameters. By PreSelectMin() and PreSelectMax() one can change the preloaded borders of the area in which PreSelect() looks for the Minimum of the Deviation of R/T_{calc} from R/T_{meas} (see there).

Do not use PreSelect() if there are more than six free parameters.

1.2 Optimize

```
int Optimize(const int anzahlPunkte, double* x, double* y);
```

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int Optimize(const int anzahl_R_Punkte, double* x_R, double* y_R,
const int anzahl_T_Punkte, double* x_T, double* y_T)
(→ not yet implemented)

Description

This Function optimizes free parameters like thicknesses and/or material parameters in a layer stack for given measurement of reflexion or transmission.

Parameters

anzahlPunkte The number of points in arrays x and y.
x Array of wavelengths
y Array of R or T

Returns

E_FIT_OK	Successfull end of Optimize()
E_FIT_OPTIMIZE_FAIL	No results: Optimize() has failed
E_FIT_OPTIMIZE_POOR	Uncertain Results: Optimize() has found a solution which does not fit the measurement very well.
E_FIT_OPTIMIZE_TIMEOUT	Too much iterations: Results uncertain
E_FIT_INTERVALL	Wrong Fit-Intervall: Larger than measurement
E_FIT_STARTTHICKNESSES	Bad startvalues for thicknesses
E_FIT_START_OSZILL_PARAMETERS	Bad startvalues for material parameters
E_FIT_MEMORY	Memory Error

Comments

Optimize() needs startvalues not too far away from the Optimum. If this is not the case, use PreSelect() before. Optimize() will fail if the Reflexion or Transmission are unsensitive to changes in one or more free parameters, f.e. the thickness of the Alu-Layer in CDRW, which therefore should be fixed. Using SetPrecision() one can change the precision of the integration routines (also for PreSelect()).

1.3 SetPreSelectMin

int SetPreSelectMin(double x)

Description

Setting the left borders of the PreSelect-Search: If x = 0.8, PreSelect() will begin with setting all free parameters to 80 percent of the loaded values.

Parameters

x A double between 0.1 and 1 representing the left percent/100 - border

Returns

E_FIT_OK	Successfull end of SetPreSelectMin()
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Comments

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Screen shots

The screenshot shows a software interface with a file explorer on the left and a table of components on the right. The table is titled "Components of CDRW layer stack + Grooves". The table has columns for "File", "Type", "Size", "Date", and "Time". Two circles highlight specific rows in the table.

File	Type	Size	Date	Time
grouph	Data PH	1 KB	17.04.98	12:10
CDRW.h	Data PH	1 KB	17.04.98	12:10
Adapt.d	Data DF	8 KB	20.04.98	12:33
Vocam.d	Data DF	8 KB	20.04.98	15:34
Zmex.d	Data DF	8 KB	20.04.98	15:35
Phases.d	Data DF	8 KB	20.04.98	15:46
Phases.d	Data DF	8 KB	20.04.98	15:50
Phases.d	Data DF	8 KB	20.04.98	15:51
Phases.d	Data DF	8 KB	20.04.98	15:51
Urg2.obj	Data DB	29 KB	22.04.98	10:53
cdw.cpp	app Data	2 KB	26.04.98	15:05
cdw.h	app Data	11 KB	27.04.98	11:19
cdw.h	Data PH	2 KB	27.04.98	17:45
cdw.h	Data DF	10 KB	06.05.98	12:15
cdw.h	app Data	1 KB	08.05.98	12:08
cdw.h	Data PH	1 KB	08.05.98	12:08
cdw.h	Data DF	15 KB	08.05.98	12:14
cdw.h	Data PH	2 KB	07.05.98	12:29
Phases.d	rk Data	8 KB	08.05.98	17:23
Phases.d	rk Data	8 KB	08.05.98	17:23
Phases.d	rk Data	8 KB	08.05.98	17:23
Phases.d	rk Data	8 KB	08.05.98	17:23
Adapt.d	Data DF	15 KB	12.05.98	10:30
Adapt.d	Data PH	13 KB	14.05.98	12:07
Adapt.d	rk Data	42 KB	19.05.98	15:31
Adapt.d	app Data	2 KB	23.05.98	14:34
Adapt.d	Data PH	2 KB	25.05.98	18:20
Adapt.d	app Data	8 KB	25.05.98	15:22
Adapt.d	app Data	8 KB	25.05.98	15:22
Adapt.d	rk Data	14 KB	25.05.98	15:43
Adapt.d	rk Data	27 KB	25.05.98	15:44
Adapt.d	rk Data	20 KB	25.05.98	15:00
Adapt.d	rk Data	27 KB	25.05.98	20:27

Screen shots

SDS-System (measurement files)

File Name	Type	Size	Modified
Buttons	Buttons	91 KB	05.08.97 11:32
Buttons	Buttons	8 KB	03.11.97 09:48
Buttons	Buttons	14 KB	03.11.97 09:48
Buttons	Buttons	2 KB	12.01.98 18:18
Buttons	Buttons	2 KB	12.01.98 18:20
Buttons	Buttons	83 KB	02.02.98 18:57
Buttons	Buttons	1 KB	12.02.98 18:40
Buttons	Buttons	1 KB	12.02.98 18:46
Buttons	Buttons	1 KB	12.02.98 18:46
Buttons	Buttons	11 KB	25.02.98 22:13
Buttons	Buttons	22 KB	27.02.98 13:09
Buttons	Buttons	3 KB	27.02.98 13:13
Buttons	Buttons	2 KB	28.02.98 13:20
Buttons	Buttons	1 KB	28.02.98 13:20
Buttons	Buttons	1 KB	02.03.98 12:00
Buttons	Buttons	1 KB	02.03.98 12:00
Buttons	Buttons	1 KB	02.03.98 17:55
Buttons	Buttons	5 KB	02.03.98 17:55
Buttons	Buttons	13 KB	16.03.98 16:30
Buttons	Buttons	2 KB	22.03.98 15:41
Buttons	Buttons	36 KB	22.03.98 15:41
Buttons	Buttons	2 KB	25.03.98 15:43
Buttons	Buttons	29 KB	28.03.98 11:17
Buttons	Buttons	1 KB	27.03.98 12:23
Buttons	Buttons	1 KB	02.04.98 16:00
Buttons	Buttons	2 KB	02.04.98 16:00
Buttons	Buttons	1 KB	02.04.98 16:01
Buttons	Buttons	2 KB	02.04.98 16:08
Buttons	Buttons	28 KB	06.04.98 20:01
Buttons	Buttons	211 KB	14.04.98 14:53
Buttons	Buttons	211 KB	14.04.98 14:53
Buttons	Buttons	1 KB	15.04.98 15:36
Buttons	Buttons	1 KB	17.04.98 12:10
Buttons	Buttons	1 KB	17.04.98 12:10

Stackfit-library-file